

## ABSTRACT

A method and system for detecting, locating and quantifying a physical phenomena such as strain or a deformation in a structure. A plurality of laterally adjacent conductors may each include a plurality of segments. Each segment is constructed to exhibit a unit value representative of a defined energy transmission characteristic. A plurality of identity groups are defined with each identity group comprising a plurality of segments including at least one segment from each of the plurality of conductors. The segments contained within an identity group are configured and arranged such that each of their associated unit values may be represented by a concatenated digit string which is a unique number relative to the other identity groups. Additionally, the unit values of the segments within an identity group maintain unique ratios with respect to the other unit values in the identity group.